DOCUMENT RESUME

ED 109 986 IR 002 248

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TITLE Effects of a Roleplay/Game on Players' Attitudes Towards Instructional Games.
INSTITUTION Indiana Univ., Bloomington. Center for Innovation in Teaching the Handicapped.
PUB DATE Apr 75
NOTE 20p.; Paper presented at the Annual Meeting of the Association for Educational Communications and Technology (Dallas, Texas, April 17, 1975)

EDRS PRICE MF-$0.76 HC-$1.58 PLUS POSTAGE
DESCRIPTORS Affective Behavior; Attitudes; Attitude Tests; Class Attitudes; *Educational Games; Education Courses; Experiments; Games; Higher Education; Post Testing; Pretesting; *Research; *Role Playing; Schools of Education; *Student Attitudes; *Teaching Methods
IDENTIFIERS Indiana University

ABSTRACT

Eighty-five students in education courses at the University of Indiana participated in a study to determine the potential effects of instructional games in changing players' attitudes. The game selected was intended to make players more positive in their attitude toward the use of instructional games. Each player (1) was asked to predict the average attitude of the group, (2) took a pretest of attitudes, (3) took part in a discussion of the pro's and con's of instructional games under assumed roles, and (4) took a posttest on attitudes. An analysis of variance indicated no main effects due either to the pretesting or to the game itself, but a significant interaction effect between the two was found. However, the results must be interpreted with care, as there may be serious problems in the experimental design. The appendixes include the test instrument used and a description of the roles given to the players. (DGC)

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Effects of a Roleplay/Game on Players' Attitudes Towards Instructional Games

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AECT National Convention
Dallas, Texas
April 17, 1975

IR002248

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The overall goal of our study was to determine the potential effect of instructional games in the changing of players' attitudes. In order to investigate this affective effect, we selected a game designed by Thiagarajan (1974) called GAMEgame III. The object of this game is to make players more positive in their attitude toward the use of instructional games. The game involves players (1) predicting the average attitude of the group, (2) taking a pretest measurement of their attitudes, (3) participating in a discussion of the pro's and con's of instructional games under an assumed role, and (4) taking a posttest measurement of their attitudes.

According to the developer of the game, the entire treatment (including the built-in attitude measurement) should result in a positive attitude toward instructional games. However, because of the well-known sensitizing effect of pretesting (Campbell & Stanley, 1963), we wanted to separately measure the effect of such a pretest and the rest of the "game treatment." Hence the first three questions in our study were:

1. Does pretesting of players result in any change in the subsequent measurement of their attitude?
2. Does playing the game result in any change in the players' attitudes?
3. Are there any interactions between the effects of pretesting and playing the game?

As an integral part of the game, players are informed about the group's baseline attitude before they take the posttest. Because of the influence

of the desire for conformity (Feldman & Newcomb, 1969) we believe that this aspect of the game will bring extreme scorers closer to the group mean. To test for this, we came up with the following question:

4. Does the knowledge of mean attitude score influence the group's posttest score?

The game involves a heavy amount of roleplaying. Studies on the effect of roleplaying suggest that a person's attitude shifts in the direction of the assigned role (Cohen, 1964). The fifth question investigated in the study is:

5. Do players' attitudes shift toward the direction of the role given to them?

METHOD

Game and instrument. As indicated earlier, the game used in this study was GAMEgame III by Thiagarajan (1974). Included in this game is a 20-item Likert scale of the players' attitudes towards instructional games. This scale has a reported reliability of .78 as measured by Plummer (1973) in another study involving attitude change through the use of games.

Pilot trial. Launching into the experiment, a pilot trial was conducted with a group of 17 graduate and undergraduate students at one of the regular Center for Innovation in Teaching the Handicapped game nights to test the instrument and game procedure. A set of printed instructions was given to each participant along with a randomly assigned role. As the major purpose of the pilot was to test the measuring instrument, the procedural steps and the game itself, the data collected was not analyzed.

On the basis of the trial session, printed instructions were discarded as too confusing and distracting. One experimenter was designated to act as game leader for all subsequent groups, an oral set of instructions was designed, and a fixed procedure for each treatment was established.

Subjects. The subjects for all treatment groups were male and female students enrolled in education courses within the School of Education, Indiana University, Bloomington. They were not aware that they were participating in an experiment. (N=85)

Instructors of education courses were asked to provide time during their class activities to permit the experimenters to play GAMEgame III with the students. The instructors were told that this game would teach their students about the use of instructional games in the classroom. From nine classes offered, five were randomly selected for the study. Treatments were randomly assigned to each class. Although intact classes were utilized, the experimenters had been informed that assignment of students to the various classes had been made on the basis of time convenience alone and that the classes were very heterogeneous in character. Each group varied in size from 16 to 27. Roles for the roleplay part of the game were randomly assigned to subjects within groups.

Game. The game, GAMEgame III, utilized for this experiment was developed by Thiagarajan and Stolovitch at CITH, Indiana University. It is an instructional game involving roleplay by the game participants. Its main objective is to get participants to identify the main characteristics of instructional games and provide a series of advantages or disadvantages in using instructional games in the classroom. GAMEgame III consists of nine parts:

1. Following a brief introduction to the term instructional games, participants are asked to predict what the group attitude toward the use of instructional games might be (scale of 20=very negative to 100=very positive). The prediction cards are then hidden by each participant.

2. A 20-item, 5-point Likert scale is administered to the participants who are asked to indicate their own individual feelings about instructional games.

3. The participants are asked to examine a role sheet which has been randomly distributed to each of them. The sheet contains one characteristic of instructional games and a set of arguments either positive or negative concerning the characteristic.

4. The game leader calls out one of the characteristics and asks if anyone can argue for or against it. On the basis of the arguments provided by the role sheet plus any inventions or experiences participants wish to call upon, a debate ensues. Every five minutes, the game leader calls out a new characteristic and other participants debate. There are no rules for the debates. Participants shout each other down, lend support to others and generally mix it up free-for-all style so long as they keep the roles assigned them. After all five characteristics of instructional games are debated pro and con, each participant makes a summary argument to end this phase of the game.

During the roleplay, the game managers score the attitude scales of the participants and find the actual group mean attitude toward the use of instructional games.

5. The game leader asks the participants to refer to their predictions of the initial group attitude toward instructional games. The person

who predicted closest to the actual mean as determined by the attitude scale scores is named the winner.

6. To permit a second chance, participants are then asked to make a second prediction about the class' new attitude toward instructional games, having discussed the topic more fully. The predictions are once more hidden.

7. The same attitude scale is administered.

8. While a debriefing discussion ensues with the game leader and participants, game managers score the second set of attitude scales and find the new class mean.

9. Predictions are disclosed and a second winner declared on the basis of coming closest to the new actual class attitude.

Procedure. The study employed a basic Solomon four group design (Campbell & Stanley, 1968) with a fifth group included in order to test the effect of not providing the original actual group mean until after the attitude scale had been administered for the second time. The final design, thus, can be graphically represented as follows:

Group 1:	0	X+M	0
Group 2:	0	X-M	0
Group 3:	0		0
Group 4:		X	0
Group 5:			0

Group 1: Subjects played GAMEgame III exactly as set out in the description of the GAMEgame III steps. (n=23)

Group 2: Subjects played GAMEgame III as described above except that the actual mean attitude of the group as measured by the first presentation of the attitude scale was withheld until the subjects had completed the second administration of the attitude scale. (n=23)

Group 3: The attitude scale was presented at the beginning of a normal class period to all subjects. The usual instructor held his class with no reference to games. At the end of one hour, the experimenter returned and presented the group with the same attitude scale for a second time. (n= 20)

Group 4: After a brief introduction to instructional games (the same as was used with groups 1 & 2) the roles were randomly assigned to subjects and steps three to nine carried out. Step five was naturally omitted as no pre-treatment prediction or attitude scores were established. (n=26)

Group 5: At the end of a normal class period, the experimenters administered the attitude scale with only a brief explanation that data on attitudes towards instructional games were being collected. (n=16)

All treatments lasted for approximately 25 minutes (Groups 1, 2, 4). Total pretest, treatment, posttest, debriefing lasted about one hour. For this reason approximately one hour was permitted to elapse between pre- and posttest attitude scale presentations with Group 3.

All instructions were administered orally by the same game leader using a basic pattern which varied only in minor ways from group to group.

All treatments were administered within a period of three weeks.

RESULTS

The analysis of variance (Table 1) indicates no main effects due either to the pretesting or to the game. However, there is a significant interaction effect (= .05):

TABLE 1

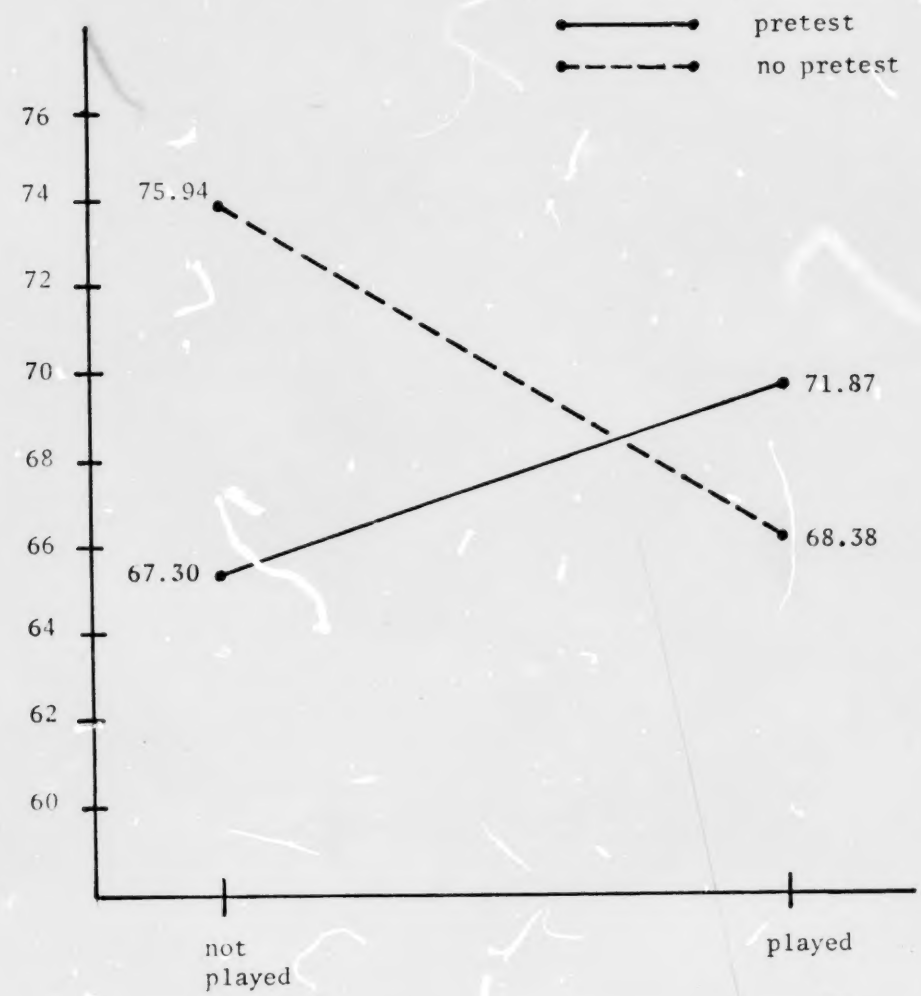
Analysis of Variance

Source	D.F.	S.S.	M.S.	F
Pretest	1	136.5	136.5	.77
Game	1	45.8	45.8	.26
Pretest X Game	1	755.8	755.8	4.29
Residual	81	14247.9	175.9	
Total	84	15185.9		

Table 2 shows the actual values of the means. The interaction is graphically shown in Figure 1.

		Pretest	
		Administered	Not Administered
Game	Not played	67.30	75.94
	Played	71.87	68.38

Figure 1. Interaction between pretest and game play.



A t-test comparing the means of the Groups I and II yields a t-value of 1.02 which is not significant. Hence the expected conformity effects of providing baseline attitude scores failed to materialize.

A point-biserial correlation (Glass and Stanley, 1970) of .44 was obtained between the players' role assignments (positive or negative) and their attitude shift (posttest score - pretest score). A t-value corresponding to this correlation coefficient (Seetharaman, 1958) was found to be 2.24 which indicates that this correlation is significantly different from chance alone at the .01 level. Hence the phenomenon of roleplayers' attitudes changing in the direction of the prescribed roles is replicated in this study.

CONCLUSIONS

It is extremely unlikely that the results of our study are generalizable to any extent. The two major reasons for this are:

1. We assumed randomization of groups which turned out to be untenable. Although pretest scores are not available for all groups to undertake a meaningful test for homogeneity, our experience in various classrooms indicates that the groups were not comparable in their reaction to the use of games.

2. One of the contaminating variables which we could not control for was the "instructor" effect. In some cases the instructors were present during the game. Their attitude toward the experience appeared to be transferred to the students.

We would like to recommend a complete replication of the current study under more controlled conditions, including randomization at the subject level.

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APPENDIX A

Likert Scale of Players'
Attitude Toward Instructional Games

Given below are 20 statements about the use of instructional games. Read each statement carefully and indicate your reaction by circling one of the following coded responses:

SA = strongly agree
A = agree
U = undecided
D = disagree
SD = strongly disagree

1.	Learning is too serious for games	SA	A	U	D	SD
2.	Instructional games are worthless.	SA	A	U	D	SD
3.	People are happy when they play instructional games.	SA	A	U	D	SD
4.	Instructional games teach only trivial things.	SA	A	U	D	SD
5.	Instructional games make people uptight.	SA	A	U	D	SD
6.	People learn more from instructional games than from any other instructional activity.	SA	A	U	D	SD
7.	Instructional games are fun.	SA	A	U	D	SD
8.	Teachers should use more instructional games.	SA	A	U	D	SD
9.	People would much rather learn from books than from instructional games.	SA	A	U	D	SD
10.	Instructional games drive people up the wall.	SA	A	U	D	SD
11.	Instructional games make people learn.	SA	A	U	D	SD
12.	Instructional games are beautiful.	SA	A	U	D	SD
13.	Playing games in the classroom is a waste of time.	SA	A	U	D	SD
14.	Instructional games are too complicated.	SA	A	U	D	SD
15.	Instructional games upset people.	SA	A	U	D	SD

16.	It's a waste to spend money on instructional games.	SA	A	U	D	SD
17.	Instructional games are valuable beginning tools.	SA	A	U	D	SD
18.	Instructional games are a hassle for the teacher.	SA	A	U	D	SD
19.	People pick up a lot from an instructional game.	SA	A	U	D	SD
20.	Classrooms should be filled with instructional games.	SA	A	U	D	SD

APPENDIX B

Role Descriptions Given to Players

I. COMPLEX OBJECTIVES (NEGATIVE)

1. Instructional games, especially the simulation variety, are supposed to simplify complex pieces of reality so that the student quickly understands everything. Thus a game on what is happening in the classroom may concentrate only upon the use of reinforcement principles. Although it is true that you can easily "understand" the classroom, this understanding is shallow and distorted. There are so many other things going on in the classroom that what is simulated in the game is extremely misleading. When you get inside a real classroom you are in for a shock.

2. Games do not simulate reality but just somebody's perception of reality. And the game designer's perception could be all wrong. A behavior mod oriented person may see entirely different things in the classroom compared to a "touchy-feely" person. Neither of these is real. A game does not present reality but only a predigested version which fits one school of thought and one set of prejudices. Because of this, games do not lend themselves to teaching new ways of looking at things or finding innovative solutions.

II. COMPLEX OBJECTIVES (POSITIVE)

1. Many abstract concepts and principles taught in the classroom are too vague for the students to grasp. In an instructional game, these are reduced to concrete objects and simulated actions. This makes learning easier and more effective.

2. In higher levels of learning, the student faces complex reality.

But, participation in an actual process is so confusing and so demanding that we need to reduce the "noise" in the system and simplify the number of diverse pieces of information reaching him. By selectively constructing a simulation game, we can emphasize the relevant attributes and leave out the irrelevant ones.

3. Instructional simulation games have been found especially useful in training people on complex decision-making skills under time pressure. This result is consistently obtained in a number of evaluation studies.

III. WORKING IN GROUPS (NEGATIVE)

1 I don't want to sound like I'm antisocial, but I never had any use for group discussions and learning in groups. I think it is only the unprepared teacher who has to resort to this lazy technique. I have played many instructional games and there is absolutely nothing I have learned from them other than never to play any more games. I usually end up with a bunch of people as ignorant as I am and all we do is share our ignorance.

2. Many people say that instructional games induce cooperative learning but I think they encourage just the opposite: cutthroat competition. In the games I played with others, everybody was bent on proving that he was a Bobby Fischer or Mark Spitz. People got so uptight about the competition that hardly anyone paid any attention to learning.

3. You may say that in team games players cooperate with each other. There may be cooperation among the members of one team, but whatever positive effects it produces are destroyed by the competition between teams.

Group learning is not for me and probably it is not for any student.

I hope they will take their instructional games and go play somewhere else and leave me alone.

IV. WORKING IN GROUPS (POSITIVE)

1. When you have a heterogeneous group of learners (as in summer sessions), each with a different background and a different objective, instructional games are more efficient than any conventional technique for catering to individual differences. These games encourage mutual learning from each other. People share their knowledge and skills cooperatively.

2. Classroom situations and grading practices do not encourage cooperative learning. In an instructional game, learners cooperate with each other to learn together. Unlike the usual games, many instructional games are specially designed to produce cooperation instead of competition. As a member of a team, the player learns to balance his individual objectives with group goals.

3. With the current heavy emphasis on individualized instruction, many of the social skills usually learned in classroom groups are being totally neglected. The use of instructional games provides a new and efficient opportunity for the acquisition and the practice of these skills.

V. COST-EFFECTIVENESS (NEGATIVE)

1. Instructional games are very cost-effective. It is cheaper for you to learn how to speculate in stocks and bonds by playing a simulated business game than by actual nad expensive trial and error. This is what game designers claim and I have no doubt it is true. But is investing play money the same as doing the real thing? Of course not! And the

learner who is trained through such a game is likely to pick up many risky procedures which are unsuitable for real life situations. Just imagine what would happen if you went into the real-estate business after merely playing a couple of rounds of Monopoly. Business games are more sophisticated, but the basic difference between fake money and real money still exists.

2. Instructional simulations/games compress time to be more cost-effective. What usually takes place over a period of many years is simulated in a few hours. Thus battles of the second world war are won and lost in a matter of minutes. A teacher in a simulated classroom experiences many different disruptive behaviors in an hour which would have normally taken a couple of years of experience in real life. While this may be instructionally more efficient, it distorts the teacher's perceptions of reality. Teachers trained by such a game may become restless and bored if they are not confronted by a rapid succession of disruptive behaviors. Worse yet, even normal behaviors may appear as disruptive in their eyes because they are conditioned to an unreal state of affairs.

VI. COST-EFFECTIVENESS (POSITIVE)

1. Instructional games are more effective than any other conventional method of teaching and less expensive than actual field training. It is more effective to train somebody on how to speculate on stocks and bonds by having him play a realistic business game than listen to a lecture. At the same time this procedure is cheaper than investing real money in real stocks.

2. Instructional games are efficient because you can portray a number of critical incidents within a limited period. In real life,

on-the-job training, these critical incidents occur very rarely. Even after a number of years' experience, an airplane pilot may not experience all possible emergencies. But it is easy to train him on a simulator for these emergencies.

VII. AFFECTIVE OBJECTIVES (NEGATIVE)

1. There is no doubt that instructional games efficiently produce attitude changes. And herein lies a major danger. How are we to be sure that the types of attitudinal objectives which the game designer wants to attain are worthy of being attained?

2. Is it the teacher's job to change the student's values, beliefs, and attitudes? Or should this be left to home and the family? How are we going to prevent a radical teacher from designing and using a Watergate simulation which paints a pessimistic picture of politics? It is equally probably that another conservative teacher may design his own simulation of the same incident and paint a dark picture of a media conspiracy. In instructional simulation games we have a powerful brainwashing technique.

3. However hard a game designer may try, there is no way to keep his attitudinal biases from creeping into the design of the game. Already many game users in church and community organizations have realized this danger and are seriously trying to find their way through this controversial area. Until some solution is found to this problem, instructional simulation games--especially in politics and social studies--are full of potential danger in altering the learner's attitude in an undesirable direction.

VIII. AFFECTIVE OBJECTIVES (POSITIVE)

1. Most of the learning in the classroom is cognitive. Schools concentrate on educating the intellect of the learners to the total neglect of their emotional development. With instructional games we have an efficient tool to help learners acquire various affective attitudes.

2. Many of the psychological principles of attitude acquisition can be easily and efficiently incorporated into the design of a simulation game. Thus affective education can proceed within the pleasant context of play.

3. Games have already established their ability to sensitize players to the plight of ghetto residents and the problems of world-wide starvation. These games point out the major inequities in our society and produce learners who are more sensitive and aware.

IX. MOTIVATION (NEGATIVE)

1. Contrary to what teachers may believe at first sight, the high level of motivation generated by instructional games is extremely undesirable and even dangerous. Studies in the psychology of learning and motivation clearly and consistently indicate that such high degrees of motivation encourage the learner to perform at a high level but learn at a very low level. The highly motivated student is so uptight about winning the game that nothing sticks in his mind.

2. Learning is too serious for fun and games. Whether you believe this or not, this is what many people believe. Such an attitude--call it puritanical if you want to--does exist and does make learners feel guilty and uncomfortable about enjoying and educating themselves at the same time. Edgar Dale, the great educator, clearly points out that as teachers it is our business to educate and leave entertainment to

professionals. This underlying belief creates antagonism between teachers who use games and those who don't. This sorry state of affairs can be resolved simply by leaving fun and games out of the classroom and to recreation leaders.

3. After you use an exciting game in the classroom, what do you do for an encore? Most learning is dull and mundane; a true scholar has to read through a book or sit through a lecture. With games we do not encourage the proper attitude toward learning. Already many children are becoming restless in classrooms just because school is not one big game session. Extrinsic motivation through games has removed all the intrinsic joys learning has to offer.

X. MOTIVATION (POSITIVE)

1. No other form of teaching learning is as highly motivating as the use of simulation games. This degree of motivation enables the learner to acquire new skills without drudgery and apply them immediately in a game situation.

2. Instructional games encourage the learner to assume more responsibility for his own learning. The learner actively participates in the game and in the learning which evolves out of the game. With a lecture or a textbook, the learner is reduced to the state of passive reception. Not so in instructional games. He has to actively and continuously participate in the learning process.

3. A major complaint from all learners is the lack of relevance of what they are learning. Instructional simulation games relate learning to real-life problems. Because the learner gets an immediate chance to apply his newly-learned skills and knowledge to the playing of the game, his learning acquires immediate relevance.